

# Everglades

## Restoration Progress

2016

### BACKGROUND:

America's Everglades was once a vibrant, free-flowing River of Grass, extending from the Kissimmee Chain of Lakes near Orlando to the southern tip of the peninsula and Florida Bay. Over time, significant development allowed for population and economic growth. The construction of canals and water control structures, along with increased water needs due to urban and agricultural expansion, contributed to unintended environmental consequences.

Recognizing that a healthy ecosystem is vital to a healthy economy, a number of initiatives are under way to improve water quality, increase storage and reestablish more historic flows.

**The South Florida Water Management District** is a regional governmental agency that manages the water resources in the southern part of the state. It is the oldest and largest of the state's five water management districts.

**Our Mission** is to manage and protect water resources of the region by balancing and improving flood control, water supply, water quality and natural systems.

### Improving Water Quality

*Since 1994, the State of Florida has invested more than \$2 billion toward lowering phosphorus levels in Everglades-bound water through a combination of source control Best Management Practices (BMPs) and constructed wetlands, known as Stormwater Treatment Areas (STAs). BMPs fine-tune onsite processes to prevent or reduce phosphorus in discharges from the source and STAs use "green technology" to remove excess phosphorus.*

- Five **Everglades STAs** are operational with an effective treatment area of 57,000 acres, including 12,000 acres completed in 2012.
- In Water Year 2016, these wetlands treated approximately 1.4 million acre-feet of water, reducing phosphorus loads by 86 percent. To date, the STAs have treated more than 17 million acre-feet of water and have retained approximately 2,220 metric tons of phosphorus.
- Since its 1995 implementation, SFWMD's regulatory source control program on agricultural lands south of Lake Okeechobee has resulted in a long-term average

phosphorus reduction greater than 50 percent, more than twice what is required by state law.

- To date, these controls and regional STAs together have prevented approximately 5,275 metric tons of phosphorus from entering the Everglades.
- **Restoration Strategies** - The SFWMD is creating more than 6,500 acres of new STAs and 116,000 acre-feet of additional water storage through construction of shallow impoundments called Flow Equalization Basins (FEBs). These FEBs capture runoff during storm events and provide a more steady flow of water to the STAs, helping to maintain desired water levels needed to achieve optimal performance.
  - **A-1 FEB** construction is complete and operational (60,000 acre-feet of storage).
  - **L-8 FEB** construction is ongoing and is expected to be complete in 2017 (45,000 acre-feet of storage).
  - **STA-1 West Expansion #1** construction is ongoing and is expected to be complete by December 2018 (approximately 4,300 acres of effective treatment area).
  - **Conveyance improvements** required for



America's Everglades

the movement of water to and from the new FEBs and STAs are under construction.

- Sub-regional source control project support efforts included evaluation of water quality data from a recent canal cleaning demonstration project and from historic activities.
- Nine **Science Plan** studies designed to investigate the critical factors that influence phosphorus removal and better understand the sustainability of STA performance at low phosphorus concentrations are ongoing.

## Florida Bay

*Low rainfall conditions from Water Year 2015 continued into Water Year 2016 with rainfall in the region remaining well below normal until December 2015. This severe but localized drought contributed to low flows to Florida Bay, accompanied by water temperatures well above normal. The 365-day cumulative flow to Florida Bay from five monitored creeks reached a record low of 77,644 acre-feet in August 2015. Salinities in the central region of the bay exceeded 50 and the area experienced an extensive turtle grass die-off within an area of approximately 40,000 acres.*

The SFWMD initiated implementation of an innovative plan to deliver needed fresh water to Florida Bay, an immediate first step to help reduce salinity levels in the bay and promote recovery of seagrasses until larger Everglades restoration projects are built and completed.

Operational improvements increase flow of water directly into Taylor Slough in Everglades National Park, a major source of fresh water for the bay. Additional water reaching the bay during both dry and wet seasons meets stringent water quality standards.



Crews install a canal connection that will deliver freshwater to Taylor Slough and Florida Bay.

## Implementing State-Federal Restoration Projects

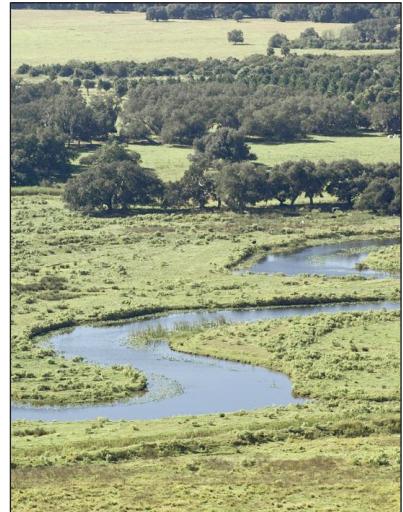
*Florida and the U.S. Army Corps of Engineers (USACE) are partners on large-scale, precedent-setting restoration efforts, including returning ecological integrity to the channelized Kissimmee River and implementing wide ranging Comprehensive Everglades Restoration Plan (CERP) projects to benefit the interconnected South Florida ecosystem.*

State and federal partners are continuously working together to implement projects on the Integrated Delivery Schedule, a schedule created through extensive public vetting that sequences the implementation and completion of all the various Everglades restoration projects to make the best use of available taxpayer dollars and maximize the benefit of each project to the Everglades. The Integrated Delivery Schedule is updated each

year to account for changes in allocated state and federal funding.

### Kissimmee River Restoration

- When complete, 40 square miles of Kissimmee River and floodplain ecosystem will be restored, including almost 25,000 acres of wetlands and 40 miles of historic river channel.
- Florida/SFWMD has acquired more than 100,000 acres of land needed for the project.
- The USACE initiated construction in 1999. Three phases are now complete – backfilling 14 miles of C-38 canal and reestablishing continuous water flow to 24 miles of river channel.
- Seasonal rains and flows now inundate 15,000 acres of restored floodplain habitat. Another 9 miles of canal is being backfilled to restore flow to 16 additional miles of the river.
- Project completion is scheduled for 2020.
- To provide the continuous water flows necessary to fully implement river restoration, planning and land acquisition are also underway to increase storage capacity in the Kissimmee Chain of Lakes - the headwaters of the river system.
- Environmental monitoring is ongoing by the SFWMD to evaluate ecosystem responses to the canal backfilling and other changes.



Kissimmee River Restoration

### Foundation Projects

- The **C-111 South Dade** project will restore more natural hydrologic conditions in Taylor Slough and Florida Bay in Everglades National Park.
  - The SFWMD is almost complete with acquisition of approximately 41,000 acres of land, and the USACE initiated two construction contracts, one in 2015 and the second in 2016. These contracts along with construction by SFWMD will complete the northern detention area and other components to complete the hydrologic link between the C-111 South Dade and Modified Water Deliveries projects. This effort is critical to the District's ability to retain water within Everglades National Park and maintain flood protection for urban and agricultural lands to the east.
- Construction of the **Modified Water Deliveries Project** by the USACE is nearing completion, and new water delivery operations to Everglades National Park are being tested.

### CERP & Critical Restoration Projects

- Florida and the SFWMD have invested approximately \$2 billion toward implementing the Comprehensive Everglades Restoration Plan. Through 2015, nearly 64 percent or 259,521 acres of lands needed for CERP have been acquired.
- **The Indian River Lagoon – South** restoration project will reduce harmful freshwater inflows and generate habitat and water

quality improvements in the St. Lucie Estuary and the Indian River Lagoon. Project components include the C-44 Reservoir and STA, C-23/C-24 North and South Reservoirs and STA, C-25 Reservoir and STA, muck removal, natural storage and treatment areas and the North Fork Natural Floodplain Restoration.

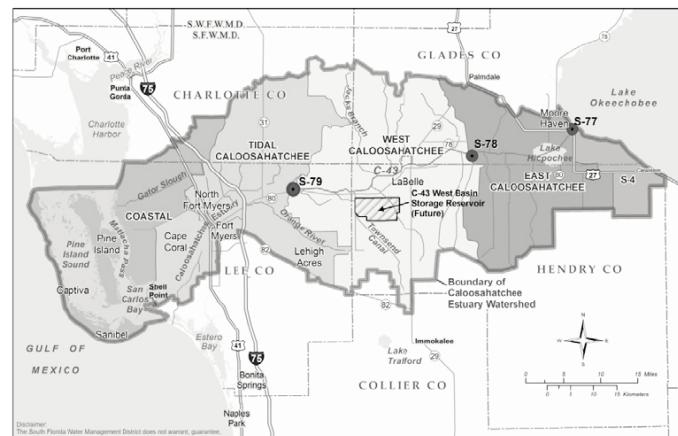
- The SFWMD completed land acquisition and design for the C-44 Reservoir and STA component. The USACE completed the first phase of construction, which includes the intake canal, and began work on the 3,400-acre reservoir in late 2015. The SFWMD has initiated construction of the 6,300-acre STA and associated features, and has also initiated construction of the reservoir pump station. The SFWMD will complete construction of the STA in 2017 and the pump station in 2018.
- The SFWMD has also acquired more than 20,000 acres of land for natural storage and treatment areas and initiated wetland restoration activities on the Allapattah Flats Natural Storage and Treatment Area in collaboration with Martin County and USDA under the Agricultural Conservation Easement Program (previously Wetland Preserve Program).

- **The Loxahatchee River Watershed Restoration Project** will identify management measures and develop a recommended plan to restore freshwater flows to the federally designated “National Wild and Scenic” Northwest Fork of the Loxahatchee River, as well as reconnect the area’s wetlands and watersheds that are the headwaters to the northwest fork. Planning is underway on a Project Implementation Report. Components that have been constructed include the G-160 and G-161 structures.
- Preliminary design for the Mecca FEB, a shallow impoundment which will provide storage in the C-18 Basin, is underway. This feature replaces the L-8 Reservoir, which was repurposed as an Everglades water quality feature.

- **The Lake Okeechobee Watershed Project (LOWP)** is developing alternatives that will capture, store and redistribute water entering the north part of Lake Okeechobee to improve lake stage levels; improve discharges to the Caloosahatchee and St. Lucie estuaries; restore/create wetland habitats; and reestablish connections among natural areas that have become spatially and/or hydrologically fragmented. If implemented, these actions will help restore more natural water deliveries; promote improved health and functionality of wetland and upland areas; and increase the quantity and quality of habitat available for native wildlife and vegetation.

- **The Western Everglades Restoration Project (WERP)**, also known as the Big Cypress/L-28 Interceptor Modification CERP Project, identified the need to restore and reconnect the western Everglades ecosystem. The purpose of this project is to improve the quantity, quality, timing and distribution of water within the western Everglades. Project features considered in WERP include modification of levees and canals, water control structures, pumps and stormwater treatment areas.

- **The Caloosahatchee River (C-43) West Basin Storage Reservoir**, authorized in the Water Resources Reform and Development Act (WRRDA) of 2014, will capture and store stormwater runoff from the C-43 Basin and reduce excess freshwater flow to the Caloosahatchee Estuary. It will also capture and store regulatory releases from Lake Okeechobee, reducing discharges to coastal estuaries during wet periods and providing flows to the estuary during dry periods.



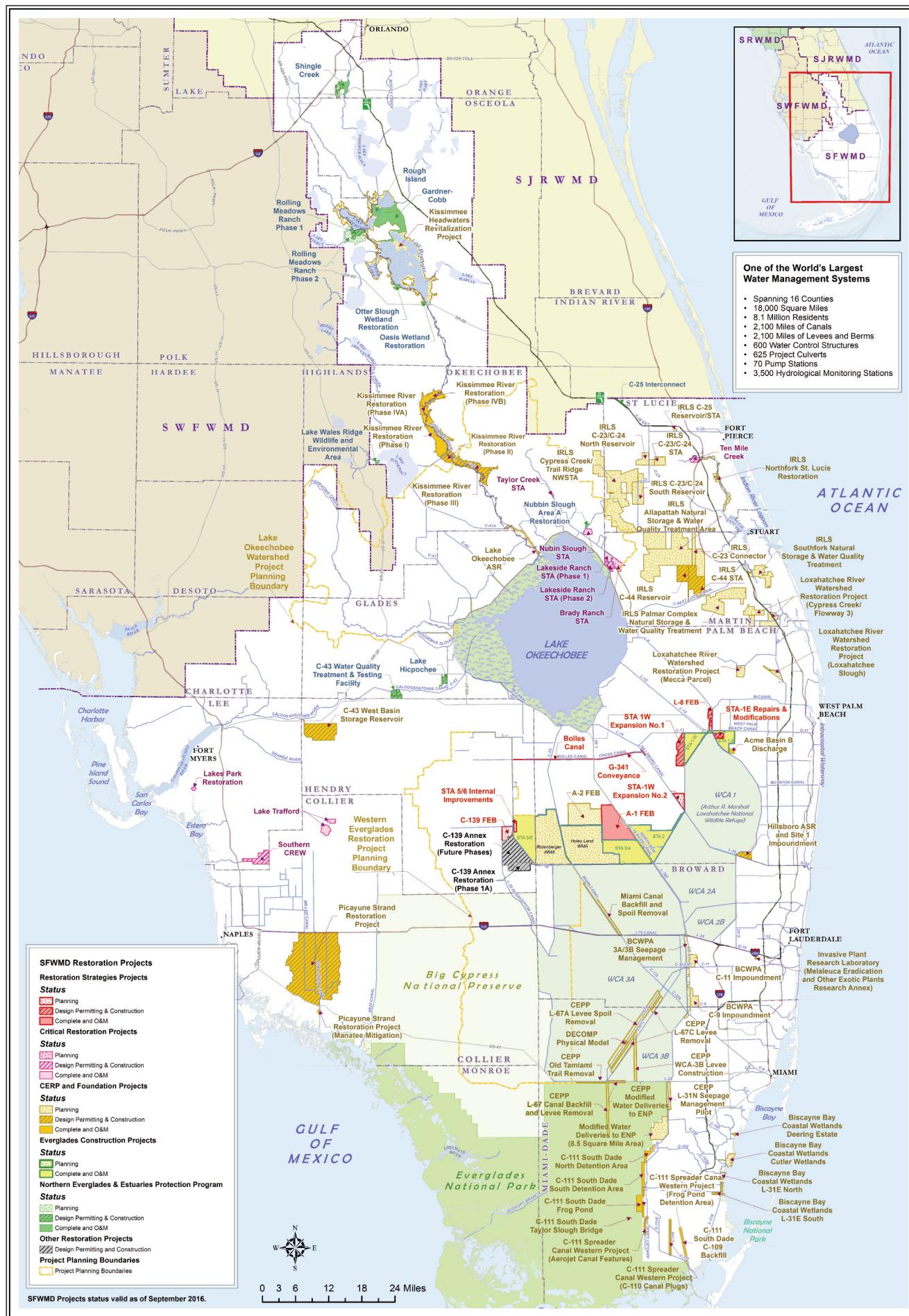
**Caloosahatchee Estuary Watershed**

- The SFWMD acquired the land with significant cost-share from the U.S. Department of the Interior. All necessary permitting is complete.
- Update of design is underway, which will allow the construction of the Project with scheduled completion in 2022.
- Preloading and demolition has been ongoing since late 2015 with scheduled completion in 2017. Work on the Irrigation Pump Station (S-476) began in summer of 2016 with a scheduled construction completion in January 2018. Additional construction packages are scheduled for September 2017 and February 2018.
- A Project Partnership Agreement between the SFWMD and the USACE was executed in June 2016.

- The **Lake Trafford Critical Restoration Project** was completed in 2010. The removal of muck build-up from the lake bottom and nearshore areas, combined with native vegetation replanting, has resulted in recovery of aquatic plants, providing important habitat for wildlife and fish to thrive in the 1,600-acre lake.
  - Submerged aquatic vegetation mapping and plantings were conducted in 2014.
  - In 2015, submerged aquatic vegetation was remapped to evaluate restoration success and to provide additional monitoring of hydrilla.
  - A study is almost complete to develop an accurate watershed boundary and delineate the flow network for Lake Trafford, which will be used to increase understanding of nutrient inputs and outputs for the lake and for future restoration efforts.

- The **Southern CREW (Corkscrew Regional Ecosystem Watershed) Critical Restoration Project** will improve or restore the hydrology and ecology of the project area with resulting benefits to upstream and downstream lands.
  - Final project design was completed in 2013 and permits for restoration have been received.
  - Florida and the SFWMD have partnered with other governmental and conservation organizations to collectively acquire 45,000 acres of the vast 60,000-acre CREW. The Southern CREW project will restore approximately 2,280 acres to wetlands.
  - Construction began on the project in February 2016 with scheduled completion in October 2017.

# Highlighted Restoration Projects



## Implementing State-Federal Restoration Projects (cont'd.)

- The **Picayune Strand Restoration** project will reestablish natural sheetflow to enhance wetlands in the 55,000-acre Picayune Strand and provide more natural freshwater inflow to the Ten Thousand Islands National Wildlife Refuge. The project includes construction of 3 pump stations with spreader canals, plugging 40 miles of canals and removing 227 miles of roads.
  - The SFWMD plugged 7 miles of Prairie Canal and removed 65 miles of roadways, resulting in more than 13,000 acres of restored and enhanced habitat
  - A series of culverts constructed under U.S. Highway 41 will restore natural sheetflow to wetlands south of the road.
  - The USACE completed the Merritt Canal pump station in 2014, with canal plugging completed in 2015. Construction of the Faka Union pump station was completed in December 2015 and the Miller pump station is scheduled for completion in summer 2017.
  - Construction of the Manatee Mitigation Feature, south of Port of the Islands, was completed in spring 2016.
- The **Broward County Water Preserve Areas** project was authorized in the WRRDA 2014 and is designed to enhance the buffer between residential development and protected Everglades wetlands, capturing and diverting stormwater runoff and reducing underground seepage from the Everglades. There are three components: WCA 3A/3B Seepage Management Area, C-11 Impoundment and C-9 Impoundment.
  - The SFWMD, with cost-share contributions from the U.S. Department of Interior, has acquired the necessary lands for this project.
  - A Project Partnership Agreement between the SFWMD and the USACE was executed in August 2016.
  - Construction of the North Mitigation Area is scheduled to start in 2018.



Biscayne Bay Coastal Wetlands

- The **Biscayne Bay Coastal Wetlands Phase I** project was authorized in the WRRDA 2014 and will restore natural water flows to Biscayne Bay and Biscayne National Park, improving salinity distribution near the shoreline. This will reestablish productive juvenile nursery habitats for shrimp, shellfish and other near-shore species.
  - The SFWMD completed construction and began operation of the Deering Estate Flow-Way component. Four of the ten culverts planned for the L-31 East component have been

completed.

- The SFWMD conducted a pilot pump test at the L-31E Flow-way during the 2015 dry season. The pump test will continue for the next several years until the permanent S-709 pump is constructed by the USACE.
- A Project Partnership Agreement between the SFWMD and the USACE was executed in August 2016.
- The **C-111 Spreader Canal Western Project** was authorized in the WRRDA 2014 and will help to restore more natural freshwater flows and levels in Taylor Slough, Model Lands and Southern Glades, with direct benefits to Everglades National Park including Florida Bay.
  - The SFWMD constructed a majority of the project features in early 2012 and has been operating these continuously once testing was complete in June 2012.
  - To obtain credit for expended funds, a Project Partnership Agreement needs to be executed which requires Federal appropriations.
- The **Central Everglades Planning Project** includes a suite of storage, treatment, conveyance and seepage management measures that will provide the necessary components to deliver additional fresh water from Lake Okeechobee south to Water Conservation Area 3, Everglades National Park and Florida Bay.
  - Once implemented, the project will restore more natural quantity, quality, timing and distribution of water flows to the remaining portions of The River of Grass.
  - The Final Integrated Project Implementation Report was published in the Federal Register in July 2014, the Chief of Engineers Report was signed in December 2014 and the Record of Decision was signed in August 2015.
  - The project received Congressional authorization in December 2016 and is awaiting appropriations.

## Protecting the Lake and Estuaries

*Passed by the Florida Legislature in 2007 and amended in 2016, the Northern Everglades and Estuaries Protection Program promotes a watershed approach to protecting Lake Okeechobee and the Caloosahatchee and St. Lucie rivers and estuaries. Protection plans, in concert with Florida Department of Environmental Protection (FDEP) adopted Basin Management Action Plans (BMAPS), include a mix of both water quality and water storage initiatives.*

- **Regulatory and voluntary source control programs** by the Florida Department of Agriculture and Consumer Services (FDACS), FDEP and the SFWMD are being implemented and are demonstrating to be cost-effective strategies for reducing nutrients in offsite discharges from the point of origin.
- The construction of three regional Stormwater Treatment Areas is expected to reduce the average phosphorus load to Lake Okeechobee by approximately 25 metric tons per year when fully operational.
  - The **Lakeside Ranch STA** is a 2,700-acre STA adjacent to Lake Okeechobee in western Martin County. The first phase (920-acre treatment area) was completed in 2012 and construction of the second phase began in January 2016. The Lakeside Ranch STA Phase I removed 13 metric tons of



Lakeside Ranch STA in Martin County

total phosphorus in Water Year 2016.

- **Taylor Creek/Nubbin Slough STAs** are two pilot-scale STAs constructed by the USACE. The Taylor Creek STA removed 1.87 metric tons of total phosphorus in Water Year 2016. In March 2015, the Nubbin Slough STA Project was transferred to the District by the USACE. After approximately 9 months of consistent sampling, the start-up monitoring requirement for TP reduction was achieved in June 2016. Flow-through activities commenced in September 2016.
- The **C-43 Water Quality Treatment and Demonstration Project** is a multi-phased project to demonstrate cost-effective, wetland-based strategies for reducing total nitrogen loads and other constituents from the C-43 to help meet the Total Maximum Daily Loads established by the BMAP for the Caloosahatchee River and Estuary. Land for the project was acquired with funds from Lee County, the SFWMD and the State of Florida. The initial phase of testing (bioassays and mesocosms) began in 2014 and continues through 2018. Information from Phase I demonstrations will be used to guide future phases of the project.

- The **Lake Hicpochee Shallow Storage and Hydrologic Enhancement** project will capture surface water from the C-19 Canal, which discharges directly into the Caloosahatchee River (C-43), hold the water in a shallow storage feature north of the lake, and distribute the stored water via a spreader canal onto the



C-43 Water Quality Treatment and Testing Facility in Hendry County

northwest area of Lake Hicpochee. Final engineering design is complete. Phase I construction is planned to begin in 2017.

- Through the **Dispersed Water Management** program, temporary water retention is being provided in the Northern Everglades. The program provides interim storage through the use of both public and private lands in private/public partnership until larger permanent regional projects are implemented.
  - Approximately 96,590 acre-feet of annual storage/retention has been achieved in the Northern Everglades, with the majority located in the Lake Okeechobee watershed.
  - Approximately 309,000 acre-feet of additional storage projects are in planning, design/permitting, or under construction.
- **Cost-Share Projects** with local governments assist with implementation of stormwater management, alternative water supply and water conservation projects. Florida supports these initiatives and has cost-shared numerous local projects in the Lake and River watersheds.
  - Since 2010, the SFWMD has supported more than 50 local projects in the Big Cypress Basin and has provided nearly \$22 million in total to Collier County and the cities of Everglades City, Marco Island and Naples.
  - In cooperation with the Town of Windermere and Orange County, a series of stormwater projects were completed during 2015 and 2016 to improve water quality in the Butler Chain of Lakes.
  - In cooperation with Glades County, the Moore Haven Canal is being dredged and a linear park is under construction.
  - The SFWMD coordinates and partners on a number of initiatives including Charlotte Harbor Flatwoods, South Lee County Watershed, Lehigh Headwaters, Loxahatchee River Preservation, St Lucie Issues Team and Lake Worth Lagoon Initiatives.
  - The SFWMD initiated a Cooperative Funding Program to support local water resource projects in FY2016-17. Seventy-one projects were funded which focus efforts on stormwater, water conservation and alternative water supply projects.

- FDEP's **Basin Management Action Plans (BMAPs)** are the overarching water quality restoration plans for the Northern Everglades. They are blueprints for restoring impaired waters through the reduction of pollutant loads to meet the allowable load established in a Total Maximum Daily Load limit. The BMAP is a comprehensive set of strategies such as permit limits on wastewater facilities, urban and agricultural best management practices, conservation programs, financial assistance and revenue-generating activities.

These strategies are developed with local stakeholder input and a commitment by named agencies to collaboratively and independently implement. The SFWMD is a collaborative partner in BMAP implementation for the Lake Okeechobee, St. Lucie and Caloosahatchee watersheds.

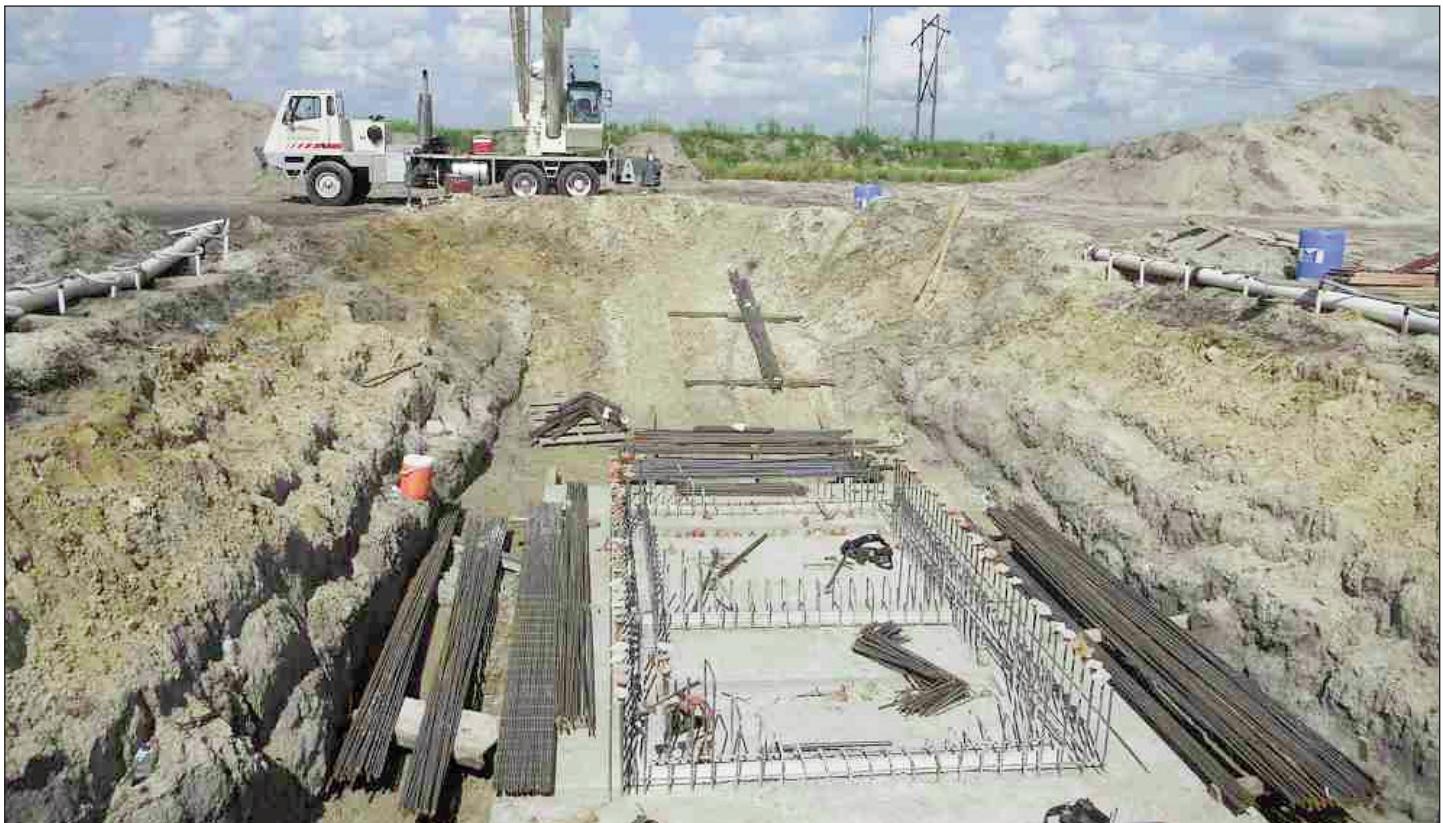
## EVERGLADES RESTORATION PROGRESS – 2017

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C-43 Caloosahatchee Reservoir under construction on the west coast

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C-44 Reservoir under construction on the east coast

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